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Competition of RKKY and Dipolar Interactions in Trilayers Exhibiting the Exchange Bias*

T. M. Hong[1], M. T. Lin[2]

[1] *Department of Physics, National Tsing Hua University, Hsinchu 300, Taiwan*
[2] *Department of Physics, National Taiwan University, Taipei 106, Taiwan*

The coexistence of RKKY interaction and Kondo effect is responsible for the delicate magnetic and transport properties in the heavy-fermion compounds, but decades-long theoretical efforts to describe it are far from being complete. We believe a final solution has to rely on a better understanding of the participating interactions in other systems. Take our study for instance, a nonmagnetic metallic spacer is inserted into the usual F/AF (ferro/antiferromagnetic) bilayers that shows the exchange bias. This allows the bias to be mediated by the RKKY interaction. But due to the AF insulator, the RKKY interaction is greatly suppressed and becomes of the same magnitude as the direct dipolar interaction. The competition between them provides us with an easier example to study how the RKKY interaction is modified in the presence of other effects.

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